REMARKS/ARGUMENTS

Upon entry of the present amendment, claims 1-15 and 35-37 are pending in this application and presented for examination. Claims 16-34 have been canceled without prejudice or disclaimer. Claim 1 is currently amended. Claims 35-37 are newly added. Applicants respectfully request reconsideration of the application in view of the amendments to the claims and the following remarks.

I. FORMALITIES

Support for the amendment to the claim set is found throughout the application as originally filed. More particularly, support for the amendment to claim 1 and for newly added claims 35-37 are found, *inter alia*, on page 5, paragraph 18. Applicants submit that no new matter is present in this or any other portion of the present amendment. For the Examiner's convenience, Applicants' remarks are presented in the order in which the corresponding issues were raised in the Office Action.

II. REJECTION UNDER 35 U.S.C. § 102(b)

The Examiner has rejected claims 1-8 and 10-15 under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,136,044 ("Todd"). The Examiner alleges that while Applicants state that the cited references fail to show certain features of Applicants' invention of, for example, having embedded nanoparticles in the textile and polymer system that are not evenly distributed, the features were not recited in the claims. To the extent the rejection is applicable to the amended set of claims, Applicants respectfully traverse the rejection.

Todd teaches a process for dyeing fibers with microparticles by treating a textile with a nucleating solution followed by a metal ion solution. This process requires that a textile be incubated in a nucleating solution for a time sufficient for the nucleating agent to "***penetrate throughout the fibers of the fabric***" followed by immersion of the nucleated textile in a metal ion solution (*see*, column 6, lines 7-11, of Todd). The metal ions also penetrate throughout the textile where they are reduced upon contact with the nucleating agent. Thus, Todd teaches a two

step *in situ* method for forming a microparticle-textile composition wherein the microparticles ***penetrate throughout*** the fiber.

In stark contrast, as set forth in amended claim 1, Applicants teach and claim a nanoparticle processed textile and polymer system comprising:

> Amended claim 1 (in part):
>
> "...an embedded nanoparticle wherein said embedded nanoparticle is distributed in a gradually diluted pattern, having a higher density at or near the surface of said textile and polymer system and gradually decreasing density toward the core of said textile and polymer system;..."

Applicants' claimed feature of having *embedded nanoparticles* wherein the nanoparticles show high density at or near the surface with a gradual decreasing density toward the core of the fiber or polymer, is simply not taught or suggested by Todd.

The Examiner further alleges that Todd teaches surface property changes, such as color, which is a teaching that at least a portion of his microparticles are at the surface of the fabric (*see*, Table 4, column 11-12). However, Todd does not teach that color change is attributed to the microparticles residing at the surface of the fabric. Rather, Todd describes that variation in color can occur when the same dye solutions are applied to different types of fabrics and that this variation is attributed to the fact that the microparticles *penetrate throughout the fiber* and as such the "intimate association of the microparticle and fiber may explain the variation in color that occur[s]" (*see*, column 4, lines 17-20, of Todd). As such, Todd simply does not teach Applicants' claimed invention of a nanoparticle processed textile or polymer system wherein the nanoparticles are distributed in a gradually diluted pattern throughout the fiber as is presently taught and claimed. Rather, Todd discloses a two step *in situ* method for forming a microparticle-textile composition wherein the microparticles penetrate throughout the fiber. Therefore, Applicants submit that the present claims are not anticipated by Todd. As such, Applicants respectfully request that the rejection be withdrawn.

III. FIRST REJECTION UNDER 35 U.S.C. § 102(e)

The Examiner has maintained the rejection under 35 U.S.C. § 102(e) of claims 1-8, 10-11 and 15 as allegedly being anticipated by U.S. Patent No. 6,516,633 ("Erskine *et al.*"). To the extent the rejection is applicable to the amended claim set, Applicants respectfully traverse the rejection.

Erskine *et al.* teach a textile composition having a glass-enclosed nanoparticle with reactive functional groups that is used to attach the nanoparticle to a macro-material (*see*, column 3, line 63, bridging to column 4, line 33, of Erskine *et al.*). In the nanoparticle textiles of Erskine, the nanoparticles are ***chemically attached*** to the surface of the fiber, for example, *via* a hydroxyl group to coat the surface of the textile.

Erskine *et al.* disclose at column 6, lines 50-57:

> The textile-reactive functional groups on the nanoparticle surface (either the surface capping agent or reacted polymer) react with the textile or web, by **covalent bonding**, to permanently attach to the textile. This curing can take place either before or after the treated textile is removed from the solution and dried, although it is generally preferred that the cure occur after the drying step.

In stark contrast, Applicants teach a completely different type of nanoparticle composition wherein the nanoparticles are ***embedded*** in a textile in a gradient fashion. The claimed embedded nanoparticle is retained on the textile or polymer system *without* being covalently attached thereto (*see*, page 14, lines 18-20, of Erskine *et al.*). As amended, claim 1 clearly sets forth that the textile and polymer system of the present invention comprises ***an embedded nanoparticle***, "wherein said embedded nanoparticle is distributed in a gradually diluted pattern, having higher density at or near the surface of said textile and polymer system and gradually decreasing density toward the core of said textile and polymer system".

Erskine *et al.* simply do not teach a textile and polymer system comprising an embedded nanoparticle wherein the particles show high density at the surface of the textile with a gradual decreasing density toward the core of the textile or polymer as is presently taught and

claimed. As such, Erskine *et al.* do not anticipate the instant invention. Therefore, Applicants respectfully request that the rejection be withdrawn.

IV. SECOND REJECTION UNDER 35 U.S.C. § 102(e)

The Examiner has maintained the rejection under 35 U.S.C. § 102(e) of claims 1-8, 10 and 12-15 as allegedly anticipated by US 2003/0013369 ("Soane *et. al.*"). To the extent the rejection is applicable to the amended claim set, Applicants respectfully traverse the rejection.

Soane *et al.* disclose and claim a textile reactive nanoparticle comprising a payload entrapped in a polymeric encapsulator having a textile reactive functional group on its surface for attaching to a textile fiber (*see*, claim 1, of Soane *et al.*). Much like Erskine *et al.*, the nanoparticles of Soane *et al.* are ***chemically attached*** to the textile, for example, *via* hydroxyl groups (*see*, page 6, paragraph 94, line 7-10, of Soane *et al.*).

Again, Applicants teach and claim an embedded nanoparticle textile and polymer system. As clearly recited in amended claim 1, the term "embedded nanoparticles" means that the nanoparticles are not evenly distributed throughout the fiber, but rather are distributed in a gradually diluted pattern from the surface of the fiber to the core of the fiber with a higher concentration near the surface of the fiber (*see*, claim 1). Applicants further disclose that the gradient distribution of the nanoparticles in Applicants' composition can be achieved by, for example, subjecting the nanoparticle-treated textile to heat treatment to open up the polymer textile and provide energy for the nanoparticles to move from the surface of the fiber to the deeper layers, which will result in a distribution of the nanoparticles in the claimed gradient pattern.

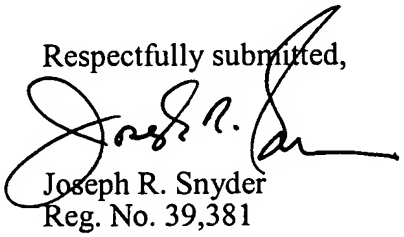
Soane *et al.* teach nanoparticles that are chemically and thus, permanently affixed on the textile composition. Soane *et al.* simply do not teach the inventive distribution profile of the embedded nanoparticles of the present invention. As such, Soane *et al.* do not anticipate the present invention. Therefore, Applicants respectfully request that the rejection be withdrawn.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 925-472-5000.

Respectfully submitted,



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